Space Weather Forecast

Issued on Saturday, 20 July 2024 at 01:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Isolated Moderate class flares expected. Chance of G1 Minor Storms day 1 (20 Jul)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with two Moderate class-flares observed. The strongest flare was at 19/0823 UTC from a small region in the northwest, with a further Moderate flare also observed at 19/1825 UTC from the largest of the fifteen sunspot regions currently visible. This is also the most complex sunspot group on the disc, currently located in the south-centre disc. Some simplification of this region has occurred, consolidating into three main, but still small and rather ragged spots. The interior spot, however, maintains some mixed magnetic polarities. Rapid growth was also observed in a newly numbered and emergent spot to the east of this region. While this currently has a relatively simple bipolar structure, any further growth has the potential to destabilise the large spot due to its proximity. The other regions on the disc are generally smaller and either stable or decaying. The only exception is a moderately sized region in the southwest, with some limited growth observed, however this remains a simple bipolar region

A large eruption was observed off the south-centre disc just after 19/1930 UTC, due to a 'filament eruption'. These occur when a line of material, held together but observed the Sun's surface by its magnetic field, becomes unstable and is erupted. A coronal mass ejection (CME) likely occurred and despite it having a likely southward bias, an Earth-directed component is possible. However sufficient imagery is currently not available to assess this.

Solar Wind / Geomagnetic Activity: The solar wind speed was at background, 300-350 km/s. Density was average or below. Interplanetary magnetic field (IMF) was Weak with its north-south component also weak and variable. Geomagnetic activity was Quiet throughout (Kp 0-1).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms occurring

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is expected with further M-class flares. These most likely from the complex region located in the south-centre. However, given the number of sunspots isolated flares are possible from across the disc.

Solar Wind /Geomagnetic Activity: The CMEs from the Moderate flares at 16/2206 UTC are expected to arrive early day 1 (20 Jul), with any influence easing later that day and into day 2 (21 Jul). Otherwise slow wind conditions are expected to persist. Mainly Quiet geomagnetic activity is expected overall, but brief Unsettled to Active enhancements are possible day 1-2 (18-19 Jul) from any fast wind interaction, and Active to G1 Minor Storm intervals day 2-3 (19-20 Jul) with any CME arrival.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is likely to remain at background with no solar radiation storms expected. However, any notable flares will bring the potential for this to rise, with a slight chance of reaching the S1 Minor Solar Radiation Storm level.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	50	10	1	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	75	75	70	70
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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